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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/883,966

06/20/2001

Koichi Numata

109237

4446

25944 7590 10/30/2007

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ALEXANDRIA, VA 22320-4850

EXAMINER

HANDAL, KAITY V

ART UNIT

PAPER NUMBER

1797

MAIL DATE

DELIVERY MODE

10/30/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

09/883,966

Applicant(s)

NUMATA ET AL.

Examiner

Kaity Handal

Art Unit

1797

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 August 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) _____ is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 3, 4, 7, 10, 13, 19-22, 25, 26 and 31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 August 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 3-4, 7, 10, 13, 20-22, and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Noguchi et al. (US 4,036,180) in view of Gadkaree et al. (US 5,750,026) in view of Rao et al. (US 5,758,496).

With respect to claims 1, 3-4, 10, 21-22 and 31, Noguchi teaches a fuel reforming apparatus (fig. 1) comprising: a reforming catalyst (222) that reforms raw gas including hydrocarbon fuel into reformed gas including hydrogen (col. 6, lines 51-61); and a honeycomb member (222) (col. 6, lines 4-5) comprised of an interstitial material/ceramic that carries the reforming catalyst on at least one face of the honeycomb member (col. 5, lines 67 – col. 6, lines 1-5).

Noguchi fails to show details on how the catalyst layer is dispersed in the honeycomb filter, and wherein the honeycomb filter comprises a plurality of partitions that are structured to form: a raw material supply flow passage that causes the raw gas to flow along a first face of the plurality of partitions and that supplies the raw gas to the filter; and a processed gas flow passage that causes reformed and filtered gas to flow along a second face of the plurality of partitions, wherein: the reforming

catalyst is carried by the plurality of partitions on the second face on the side of the processed gas flow passage, and the first face of the plurality of partitions on the side of the raw material supply flow passage is only coated by an inactive material.

Rao teaches a honeycomb filter apparatus (fig. 4, 38) comprised of a plurality of porous (col. 1, lines 48-52) partitions (as illustrated) that are structured to form: a raw material supply flow passage (44) that causes the raw gas to flow along a first face of the plurality of partitions and that supplies the raw gas to the filter (illustrated); and a processed gas flow passage (46) that causes reformed and filtered gas to flow along a second face of the plurality of partitions (illustrated), wherein: the reforming catalyst/oxidation catalyst/(Platinum) (col. 4, lines 36-41) is carried by the plurality of partitions on the second face (illustrated) on the side of the processed gas flow passage (46), and the first face of the plurality of partitions on the side of the raw material supply flow passage is only coated by an inactive material/ceramic(Abstract)/(e.g. alumina as well known in the art and evidenced by US 5,956,560 – col. 18, lines 55-65) in order to provide a honeycomb filter which prevents catalyst poisoning due to the carbon particulates present by depositing the catalyst in the processed gas flow passage/(exit channels) (col. 2, lines 9-16).

It would have been obvious to replace the honeycomb of Noguchi with the honeycomb of Rao in order to provide a honeycomb filter which prevents catalyst poisoning due to the carbon particulates present by depositing the catalyst in the processed gas flow passage/(exit channels).

Noguchi teaches the need to filter out soot (col. 8, lines 4-7); however, both Noguchi and Rao fail to show details of the honeycomb member having a plurality of gaps having an effective diameter of 10-100 microns. Gadkaree teaches a honeycomb filtering member (col. 7, lines 54-57) (figures 1-2) carrying a catalyst (col. 8, lines 1-2) including a plurality of gaps having an effective diameter of 0.05-50 microns (col. 15, lines 31-36) in order to have the honeycomb structure comprise a particulate filtration medium (col. 7, lines 56-57).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to replace the honeycomb in Noguchi's apparatus with a honeycomb filtering member including a plurality of gaps having an effective diameter of 10-100 microns, as taught by Gadkaree, in order to have the honeycomb structure comprise a particulate filtration medium.

With respect to claim 13, Noguchi further teaches wherein the reforming catalyst (222) is carried by the filtering member (honeycomb supporting catalyst (222) (col. 5, lines 67 – col. 6, lines 1-5)) on the second face on the side of the processed gas flow passage (and also on the first face on the side of the raw material supply flow passage) (on the entire surfaces of the gaps) (col. 5, lines 67 – col. 6, lines 1-5).

With respect to claims 7 and 20, Noguchi teaches wherein the interstitial material forming the filtering member/honeycomb membrane is formed of a porous material/ceramic (col. 5, lines 67 – col. 6, lines 1-5).

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3. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Noguchi et al. (US 4,036,180) in view of Gadkaree et al. (US 5,750,026) in view of Rao et al. (US 5,758,496), as applied to claim 1 above, and further in view of Jahnke et al. (US 6,149,859).

With respect to claim 19, Noguchi as modified discloses all claim limitations as set forth above including a raw material preparing portion/combustion chamber (174) that gasifies hydrocarbon fuel and that mixes fuel with air but fails to show wherein said raw material preparing portion, in addition to gasifying hydrocarbon, mixes air with water vapors to prepare raw gas. Jahnke teaches a gasifier (fig. 1, 10) that gasifies hydrocarbon fuel (5) and that mixes air (6) (col. 5, lines 1-8) with water vapors (col. 5, lines 21-25) in order to prepare synthesis gas (col. 5, lines 1-8).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include a gasifier in Noguchi's modified apparatus, as taught by Jahnke, in order to prepare the synthesis gas.

4. Claims 25-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Noguchi et al. (US 4,036,180) in view of Gadkaree et al. (US 5,750,026) in view of Rao et al. (US 5,758,496), as applied to claim 21 above, and further in view of Hwang et al. (US 4,522,894) and Doty et al. (US 5,098,455).

With respect to claim 25, Noguchi as modified discloses all claim limitations as set forth above including a nickel catalyst (col. 6, lines 6-13) but fails to show wherein reformer comprises soot removing means for removing soot that has been

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trapped by the soot trapping means. Hwang teaches power production wherein soot causes a rapid increase in reactor pressure drop when a nickel catalyst is employed (col. 17, lines 16-20). Doty teaches gas filter regeneration comprising soot removing means/glow plug (fig. 1, 20) in order to burn off collected soot and regenerate filtering element (col. 5, lines 51-55) and therefore regenerate said nickel based catalyst.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide soot removing means to Noguchi's modified apparatus, as taught by Doty, in order to burn off collected soot on and regenerate filtering element and therefore regenerate said nickel based catalyst.

With respect to claim 26, Noguchi as modified teaches wherein the soot removing means/glow plug (fig. 1, 20) contacts soot that has been trapped by the soot trapping means with oxygen-containing gas/by means of burning (col. 5, lines 51-57).

Response to Arguments

35 USC 112 Rejection

Rejection made to the claims under 35 USC 112 is withdrawn by examiner to applicant's amendment.

Drawings

Objection made to the drawings is withdrawn by examiner due to applicant's amendment made to figure 2.

Prior Art Rejection

Applicant's arguments with respect to claims 1, 3-4, 7, 10, 13, 19-22, 25-26 and 31 have been considered but are moot in view of the new ground(s) of rejection as necessitated by the applicant's amendment made to the claims.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kaity Handal whose telephone number is (571) 272-8520. The examiner can normally be reached on M-F 8-5.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

KH 

10/25/2007



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